1. Choose the interval below that f composed with g at $x = 1$ is in.

$$f(x) = -2x^3 + 2x^2 - 3x \text{ and } g(x) = 2x^3 + 2x^2 - 2x$$

A. $(f \circ g)(1) \in [-36, -34]$

B. $(f \circ g)(1) \in [-19, -13]$

C. $(f \circ g)(1) \in [-10, 3]$

D. $(f \circ g)(1) \in [-31, -29]$

E. It is not possible to compose the two functions.

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2. Choose the interval below that f composed with g at $x = -1$ is in.

$$f(x) = x^3 - 4x^2 - 4x - 2 \text{ and } g(x) = -4x^3 - 1x^2 + 2x + 2$$

A. $(f \circ g)(-1) \in [-24, -18]$

B. $(f \circ g)(-1) \in [89, 99]$

C. $(f \circ g)(-1) \in [97, 107]$

D. $(f \circ g)(-1) \in [-31, -26]$

E. It is not possible to compose the two functions.

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3. Determine whether the function below is 1-1.

$$f(x) = -16x^2 - 24x + 247$$

A. No, because the domain of the function is not $(-\infty, \infty)$.

B. No, because there is a y-value that goes to 2 different x-values.

C. No, because there is an x-value that goes to 2 different y-values.

D. Yes, the function is 1-1.

E. No, because the range of the function is not $(-\infty, \infty)$.

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4. Find the inverse of the function below. Then, evaluate the inverse at $x = 10$ and choose the interval that $f^-1(10)$ belongs to.

$$f(x) = e^{x+2} - 5$$

A. $f^{-1}(10) \in [-3.55, -3.34]$

B. $f^{-1}(10) \in [-3.16, -2.67]$

C. $f^{-1}(10) \in [4.47, 4.86]$

D. $f^{-1}(10) \in [-2.54, -2.41]$

E. $f^{-1}(10) \in [0.55, 0.96]$

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5. Find the inverse of the function below (if it exists). Then, evaluate the inverse at $x = 10$ and choose the interval that $f^-1(10)$ belongs to.

$$f(x) = 2x^2 - 4$$

A. $f^{-1}(10) \in [1.77, 2.8]$

B. $f^{-1}(10) \in [2.88, 4.02]$

C. $f^{-1}(10) \in [6.38, 7.96]$

D. $f^{-1}(10) \in [0.91, 2.03]$

E. The function is not invertible for all Real numbers.

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6. Find the inverse of the function below. Then, evaluate the inverse at $x = 7$ and choose the interval that $f^-1(7)$ belongs to.

$$f(x) = \ln(x + 5) + 3$$

A. $f^{-1}(7) \in [162755.79, 162763.79]$

B. $f^{-1}(7) \in [58.6, 61.6]$

C. $f^{-1}(7) \in [22020.47, 22024.47]$

D. $f^{-1}(7) \in [47.6, 54.6]$

E. $f^{-1}(7) \in [7.39, 11.39]$

7. Find the inverse of the function below (if it exists). Then, evaluate the inverse at $x = 14$ and choose the interval that $f^-1(14)$ belongs to.

$$f(x) = \sqrt[3]{3x - 4}$$

A. $f^{-1}(14) \in [-916.4, -914.3]$

B. $f^{-1}(14) \in [-913.6, -911.7]$

C. $f^{-1}(14) \in [914.9, 919.4]$

D. $f^{-1}(14) \in [911.6, 915.6]$

E. The function is not invertible for all Real numbers.

8. Add the following functions, then choose the domain of the resulting function from the list below.

$$f(x) = \frac{1}{4x + 25} \text{ and } g(x) = \frac{4}{6x - 29}$$

A. The domain is all Real numbers except $x = a$, where $a \in [5.67, 14.67]$

B. The domain is all Real numbers less than or equal to $x = a$, where $a \in [0.33, 12.33]$

C. The domain is all Real numbers greater than or equal to $x = a$, where $a \in [-8.5, -4.5]$

D. The domain is all Real numbers except $x = a$ and $x = b$, where $a \in [-15.25, -2.25]$ and $b \in [2.83, 9.83]$

E. The domain is all Real numbers.

9. Determine whether the function below is 1-1.

$$f(x) = (4x - 18)^3$$

A. No, because there is a y-value that goes to 2 different x-values.

B. Yes, the function is 1-1.

C. No, because there is an x-value that goes to 2 different y-values.

D. No, because the range of the function is not $(-\infty, \infty)$.

E. No, because the domain of the function is not $(-\infty, \infty)$.

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10. Add the following functions, then choose the domain of the resulting function from the list below.

$$f(x) = 6x + 4 \text{ and } g(x) = \frac{1}{4x - 21}$$

A. The domain is all Real numbers less than or equal to $x = a$, where $a \in [-1.5, 4.5]$

B. The domain is all Real numbers greater than or equal to $x = a$, where $a \in [-6.67, -0.67]$

C. The domain is all Real numbers except $x = a$, where $a \in [4.25, 8.25]$

D. The domain is all Real numbers except $x = a$ and $x = b$, where $a \in [2.83, 7.83]$ and $b \in [-7.33, 1.67]$

E. The domain is all Real numbers.
